AMATEUR SATELLITE REPORT

AMSAT's Newsletter for the Amateur Space Program.

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Amateur Satellite Report

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Delay Forces Phase IIIB Launch Crew Home

Faced with an uncertain delay of from 1 to 6 weeks in the Phase IIIB launch, the AMSAT team at Kourou will be returning home after bringing the spacecraft (s/c) up to a high state of readiness. The exact cause of the delay was not known at press time although two areas of prior concern centered on the turbo pumps and the inertial navigation system.

According to W3GEY, speaking from the launch site at Kourou, "The problems are multi-dimensional and not insignificant." The result, says W3GEY, is that "a slip in schedule is virtually inevitable although the magnitude of the slip is indeterminate at this moment. We should know more tomorrow [Sunday, 24 April] and may have some more news to report then."

Launch had been scheduled for 3 June at about 12:00 UTC. The European Communications Satellite (ECS-1) is co-prime on this mission.

The AMSAT launch integration team consists of workers from AMSAT, AMSAT DL and AMSAT SA (South Africa). Their function is to check out all the s/c systems, integrate the s/c with the launcher and fuel the kick motor tanks with Nitrogen Tetroxide and UDMH (Unsymmetrical DiMethyl Hydrazine). According to W3GEY, "We will do every thing we can to bring the spacecraft up to its highest state of readiness but will leave the fueling undone. We will then return home and wait for the new launch date to be firmed. Then, when all is ready, we will return to Kourou to complete the effort; about a week's work for the team." It is understood the ECS-1 team will follow a similar routine.

Team members began arriving at Kourou around 15 April. Jan King, W3GEY, had flown to the Marburg Headquarters of AMSAT DL a week earlier than that. The s/c has been ready at Marburg for several months. After final preparations for shipping were made, Phase IIIB was shipped to Kourou about 12 April. Dick Daniels, W4PUJ, had flown to Kourou via Puerto Rico 15 April. Gordon Hardman, ZS1FE/KE3D flew to Kourou from South Africa 17 April. The AMSAT DL crew under President Dr. Karl Meinzer, DJ4ZC flew in two groups including W3GEY, on 18 and 20 April. Radio contact with the outside world comes via special stations FYØESE, FYØESZ, FYØHIG as well as the European Space Agency station FY7KRU.

Amateur Satellite Report and the AMSAT affiliated nets will carry latest information on the launch schedule as it becomes available. Revised ALINS (AMSAT Launch Information Network Service) will be issued by Project Manager and Assistant Vice President Ralph Wallio, WØRPK, as soon as a new launch schedule is announced.

Shuttle Astronaut Owen Garriott to Communicate with Radio Amateurs on Earth

Victor C. Clark (Amateur call letters W4KFC), President of the American Radio Relay League (ARRL) and Dr. Thomas A. Clark (Amateur call letters W3IWI), President of the Radio Amateur Satellite Corporation (AMSAT) today announced acceptance by the National Aeronautics and Space Administration (NASA) of a proposal submitted by their two organizations to include an amateur radio station aboard an upcoming Shuttle mission. They said that in giving its go-ahead, NASA's Associate Administrator for Manned Space Flight, Gen. James Abrahamson, has designated the STS-9/Spacelab flight, to be flown this fall, as the mission on which the amateur radio equipment will be carried.

The Space Agency's approval is based on a number of conditions which both ARRL and AMSAT find entirely acceptable. Among them are that the use of the amateur radio equipment aboard the Shuttle shall not interfere with its planned mission. Operations will be carried out on a non-interference basis during the Shuttle crew's "free time." It is also understood that special amateur radio transmitter and receiver will be furnished by the amateur radio community at no cost to NASA.

The primary mission of STS-9 is to carry the joint U.S.-European Spacelab aloft in the Shuttle's cargo bay. This particular mission was selected for the amateur operation because it includes in its crew Dr. Owen Gar-

riott (Amateur call letters W5LFL), who will serve as the operator of the spaceborne ham radio station. Dr. Garriott has been an active radio amateur for many years and is eagerly awaiting the chance to pursue his hobby from space. He commented that amateur radio has been important in developing his own professional skills and those of many others around the world involved in technical professions. He is especially pleased that NASA has given the nod for the operation as he feels that it will be instrumental in bringing the space program home to many people in this country and the rest of the world. He notes that the orbital track to be taken on the STS-9 mission makes it especially suitable for communicating with a large number of amateurs as it extends farther north and south than did earlier Space Shuttle missions.

ARRL President Vic Clark expressed his great pleasure at the NASA decision. He said that the League represents the radio amateurs of this country and, through its affiliation with the International Amateur Union (IARU), those of many countries throughout the rest of the world. Thus the ARRL is extremely happy to play a key role in this worthwhile endeavor. The joint ARRL/AMSAT proposal approved this week by NASA calls for the ARRL to furnish the special amateur radio equipment for use on the Shuttle. The ARRL will also organize and coach earthbound amateurs in techniques and procedures for rapid and efficient communication with the orbiting astronaut. This will be done through the pages of the League's monthly magazine *QST*, which reaches some one hundred and fifty thousand licensed amateurs, and its affiliated clubs throughout the U.S., Canada and the rest of the world.

Dr. Tom Clark (no relation), President of AMSAT, was also enthusiastic about the impending amateur operation from space. He noted that AMSAT is responsible for selecting appropriate frequencies and operating modes for the "ham in space" operation and made many of the initial contacts with NASA officials which preceded submission of the proposal. Dr. Clark noted that AMSAT is an international organization devoted to promoting amateur space involvement. Since its birth in 1969, AMSAT has been responsible for the successful orbiting of five "OSCAR" (Orbiting Satellite Carrying Amateur Radio) satellites, all of which were launched as secondary "piggyback" payloads on NASA missions. The newest OSCAR built by AMSAT is designed to provide world-wide communication among radio amateurs, is now poised for launch on a European ARIANE flight in June.

Another key organization involved in putting an amateur station aboard the Shuttle is the Johnson Space Center Amateur Radio Club. This group, known by the amateur radio call letters W5RRR, numbers among its members many experts well versed in testing and preparing equipment for manned space missions. Members of this club are charged with a number of tasks to insure that the ham equipment used on the Shuttle will function properly and will not disrupt other vital spacecraft functions. Included in these tasks are the adaptation of an existing Shuttle antenna design for use on the internationally recognized "Two Meter" amateur radio frequencies.

With the flight of STS-9 this fall, amateur radio will continue its long history of service. Amateur radio will provide the first time in the history of man-in-space when the general public will be able to communicate directly with an astronaut in orbit—It is expected that tens of thousands of individuals, including elementary and secondary students, citizens of developing countries and the "man on the street" will experience the excitement of hearing the words come from space "CQ from W5LFL aboard the Space Shuttle."

For additional information, contact:

Radio Amateur Satellite Corp. (AMSAT)
850 Sligo Avenue
Silver Spring, MD 20910
(301) 589-6062

American Radio Relay League (ARRL)
225 Main Street
Newington, CT 06111
(203) 666-1541

Ninth Annual Eastern VHF/UHF Conference

The 9th annual Eastern VHF/UHF Conference will be held May 13-15, 1983 at the Sheraton Tara, located in Nashua, New Hampshire at Exit 1, U.S. Route 3, approximately one-half hour north of Boston. Friday night there will be a hospitality room hosted by the Northeast VHF Association. Saturday's program will feature well-known VHFers speaking on antennas, receivers, transmitters, microwaves, and other topics of interest to VHFers. There will also be "rap-sessions" for each of the bands, chaired by persons active on the respective bands. Saturday night there will be a banquet (Banquet food at the Sheraton is generally excellent), followed by a speaker (Name to be announced later). After the banquet, everyone reassembles for the prize drawing. Sunday's program consists of the noise figure and antenna gain measurement contests (the latter if weather permits). This year it is planned to accommodate any preamp/converter IF up to 1500 MHz, so bring your converters as well as preamps. The antenna range will be set up for 432, 902, 1296, and 2304 MHz.

The fee for pre-registration is $13.50, before May 9. After that date, the fee will be $20.00. Banquet reservations must be made by May 9; the price is $14.00. For registration information, contact Rick Commo, K1LOG, 3 Pryor Road, Natick, MA 01760.

If you plan to stay at the Sheraton, mention the conference when making your reservations directly with the hotel. Be sure to request written confirmation of your reservation. For an even better price ask about the "Weekender" package. A variety of lower-priced accommodations are available within a ten-minute drive of the conference, as well as all sorts of eating establishments.

The YLs/XYLs may want to take advantage of sales-tax-free shopping in New Hampshire; in addition, a special activity is planned for them on Saturday.

New AMSAT Trinket Makes Dayton Debut

The first of a new series of AMSAT trinkets will debut at the 1983 Dayton Hamvention according to Assistant Vice President Doug Loughmiller KO5I. A new, fancy beltbuckle showing the Phase IIIB satellite, the AMSAT logo and done in brass will be available for $15 per copy Doug says. Doug co-developed this premium AMSAT fund-raiser with Senior Vice President Dr. John Champa, K8OCL. The enclosed photo shows the buckle. The buckle will also be available from AMSAT Headquarters for $15. Get your order in early to avoid disappointment.

NASA OKs ARRL-AMSAT "Ham In Space" Proposal

The National Aeronautics and Space Administration (NASA), in a letter to ARRL and AMSAT Presidents W4KFC and W3IWI, respectively, has formally approved a proposal for an astronaut, Dr. Owen Garriott, W5LFL, to carry a ham radio aboard a future space mission. The mission identified is the ninth mission of the Space Transportation System (STS) or "Shuttle" program. The proposal to allow this interesting new aspect of amateur radio to proceed originated jointly from ARRL and AMSAT. The joint ARRL/AMSAT Press Release and the letter from NASA Headquarters are presented below.

Project OSCAR Donation

Project OSCAR President Dr. John Pronko, W6XN, has announced that because the sales of the orbital prediction calendars has been very successful this year, Project OSCAR is able to donate $1000 to AMSAT. The donation will be applied to general revenues according to AMSAT.

The orbital prediction calendars published by Project OSCAR cover all the year's orbits for AMSAT-OSCAR 8, RS-5, 6, 7 and 8. The calendars are available from Project OSCAR, P.O. Box 1136, Los Altos, CA 94022. The price is $10 (U.S.), postpaid to U.S., Canada and Mexico.

NASA

National Aeronautics and Space Administration

Washington, D.C. 20546

Reply to Attn of: NS-18

APR 13 1983

Mr. Victor C. Clark, President
The American Radio Relay League
225 Main Street
Newington, CT 06111

Dr. Thomas A. Clark, President
The Radio Amateur Satellite Corporation
P.O. Box 27
Washington, DC 20044

Gentlemen:

I am pleased to inform you that your proposal to provide for Amateur Radio Communications with the Space Shuttle has been accepted. The communication equipment to be provided by you has been approved for flight on the STS-9 mission carrying Spacelab 1. Mission Specialist, Dr. Owen Garriott, a licensed radio amateur has agreed to operate the equipment during non-duty hours.

Due to the complexity of the Spacelab 1 mission the integration planning for this activity must take into account the following constraints:

- the unit will be operated by or under the direction of only a licensed amateur radio operator;
- conversation will be limited, as much as possible, to that necessary to establish ground contact and verification of that contact;
- the unit will be operated only during a crew member's off-shift time and for no longer than 1 hour per day;
- the transceiver and proposed operational scenario (including demonstration of reliability, outgassing, etc.) are approved by JSC safety;
- JSC will demonstrate to the SL-1 Mission Manager that the operation of the transceiver does not affect Spacelab mission or payload objectives;
- JSC engineering will insure no communications interference with the Orbiter or Spacelab;
- JSC and ARRL are responsible for obtaining all necessary frequency allocations and communication clearances;
- operation of the transceiver will be from the aft flight deck (AFD) only;
- addition of the transceiver will not affect pre-launch integration flows;
- payload requests for additional weight, storage volume, etc., are higher priorities than similar requests for the transceiver;
- JSC will provide assurance that the operation of the transceiver will not interfere with the efficiency of the on-shift crew, nor interfere with the sleep of the off-shift crew;
- the SL-1 Mission Manager may terminate amateur radio activities if, in his judgment, an impact to the mission is foreseen.

Further, it should be understood that all costs related to procurement, modification and qualification of the communications equipment involved will be your responsibility as well as insuring delivery of all required hardware and equipment on a schedule consistent with launch preparation requirements.

Mr. Charles E. Chassay of the Payload Integration Office, Johnson Space Center, will be responsible for all matters involving integration and test of the amateur station equipment. His mail code is LP and his phone number, (713) 483-2905. Please contact him immediately to begin planning for this installation. Mr. William D. Green, Code MC, NASA Headquarters is the cognizant Headquarters Payload Integration Manager. His phone number is (202) 755-3036.

Pre-planned communications activity involving the Amateur Radio Station should be coordinated with Headquarters Public Affairs Officer, Charles Redmond, Code E-6, (202) 755-3059.

Sincerely,

Robert F. Allnutt
Acting Associate Administrator
for External Affairs

cc:
LF-6/Mr. Duff
M/Gen. Abrahamson
MCB-7/Mr. Lee
JSC/Mr. Griffin
JSC/Mr. Lunney

25
25th Anniversary
1958-1983

Office Manager Weds AMSAT Volunteer

AMSAT Office Manager Martha Saragovitz will marry long-time AMSAT member and volunteer John Shew, N4QQ, on 1 May. The couple met in connection with their AMSAT participation. John had been the original manager of the solar cell campaign and was introduced to Martha by AMSAT Founding President Dr. Perry Klein, W3PK.

The couple will be away for a short honeymoon (hopefully) without ham radio along. Cards, gifts and greetings may be addressed to the blissful couple at AMSAT HQ, P.O. Box 27, Washington, DC 20044.

The couple appeared in *Orbit* magazine #12 on page 34.

Orbit Predictions

By Phil Karn, KA9Q

```
rs-3:
Wed Apr 20 00:04:31 1983 UTC: Ascending node at      200.4 west
Nodal period: 118.51968 min
Longitude increment: 29.756709 deg w/orbit
Element set #53
Element set epoch: Thu Apr 14 05:48:09 1983 UTC

rs-4:
Wed Apr 20 01:07:07 1983 UTC: Ascending node at      211.4 west
Nodal period: 119.39384 min
Longitude increment: 29.975457 deg w/orbit
Element set #99
Element set epoch: Wed Apr 13 03:57:26 1983 UTC

rs-5:
Wed Apr 20 00:55:32 1983 UTC: Ascending node at      207.7 west
Nodal period: 119.55405 min
Longitude increment: 30.015440 deg w/orbit
Element set #85
Element set epoch: Wed Apr 13 05:32:06 1983 UTC

rs-6:
Wed Apr 20 01:50:27 1983 UTC: Ascending node at      225.9 west
Nodal period: 118.71682 min
Longitude increment: 29.806037 deg w/orbit
Element set #51
Element set epoch: Thu Mar 31 01:02:15 1983 UTC

rs-7:
Wed Apr 20 01:29:01 1983 UTC: Ascending node at      218.0 west
Nodal period: 119.19553 min
Longitude increment: 29.925757 deg w/orbit
Element set #99
Element set epoch: Sat Apr  9 07:13:35 1983 UTC

rs-8:
Wed Apr 20 01:31:43 1983 UTC: Ascending node at      215.8 west
Nodal period: 119.76312 min
Longitude increment: 30.067892 deg w/orbit
Element set #211
Element set epoch: Wed Apr 13 17:49:43 1983 UTC

oscar-7:
Wed Apr 20 01:08:59 1983 UTC: Ascending node at      113.4 west
Nodal period: 114.93890 min
Longitude increment: 28.736680 deg w/orbit
Element set #480
Element set epoch: Sun Feb 20 09:08:52 1983 UTC

oscar-8:
Wed Apr 20 00:38:41 1983 UTC: Ascending node at       91.7 west
Nodal period: 103.16729 min
Longitude increment: 25.794192 deg w/orbit
Element set #747
Element set epoch: Tue Apr  5 11:35:39 1983 UTC

oscar-9:
Wed Apr 20 00:27:48 1983 UTC: Ascending node at      138.5 west
Nodal period: 94.70472 min
Longitude increment: 23.675069 deg w/orbit
Element set #451
Element set epoch: Tue Apr 12 09:21:46 1983 UTC
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```
Satellite: oscar-7
Catalog number: 7530
Epoch time:       83051.38116239
   Sun Feb 20 09:08:52 1983 UTC
Element set:             480
Inclination:        101.4018 deg
RA of node:          55.0594 deg
Eccentricity:      0.0012395
Arg of perigee:     107.4687 deg
Mean anomaly:       252.7737 deg
Mean motion:    12.53382218 rev/day
Decay rate:         -6e-08 rev/day^2
Epoch rev:           37819
Semi major axis:  7829.761 km
Anom period:     114.889136 min
Apogee:           1480.019 km
Perigee:          1460.609 km

Satellite: oscar-8
Catalog number: 10703
Epoch time:       83095.48310067
   Tue Apr  5 11:35:40 1983 UTC
Element set:             747
Inclination:        98.7562 deg
RA of node:        111.6640 deg
Eccentricity:      0.0006572
Arg of perigee:    155.6938 deg
Mean anomaly:      204.4460 deg
Mean motion:    13.96551443 rev/day
Decay rate:         2.93e-06 rev/day^2
Epoch rev:           25909
Semi major axis:  7285.307 km
Anom period:     103.111132 min
Apogee:           915.489 km
Perigee:          905.913 km
Translate freq:   581.0974 mhz
Invert:                  1
Beacon:           435.0965 mhz
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Satellite: oscar-9
Catalog number: 12888
Epoch time:       83102.39011618
   Tue Apr 12 09:21:46 1983 UTC
Element set:             451
Inclination:        97.5394 deg
RA of node:         68.3596 deg
Eccentricity:      0.0002772
Arg of perigee:    147.1975 deg
Mean anomaly:      212.9377 deg
Mean motion:    15.21407223 rev/day
Decay rate:         5.025e-05 rev/day^2
Epoch rev:            8379
Semi major axis:  6881.251 km
Anom period:      94.649215 min
Apogee:           511.182 km
Perigee:          507.367 km
Beacon:           145.8250 mhz

Satellite: rs-3
Catalog number: 12997
Epoch time:       83104.24177233
   Thu Apr 14 05:48:09 1983 UTC
Element set:              53
Inclination:        82.9600 deg
RA of node:         11.4749 deg
Eccentricity:      0.0058104
Arg of perigee:    166.6946 deg
Mean anomaly:      193.5666 deg
Mean motion:    12.15575695 rev/day
Decay rate:           4e-08 rev/day^2
Epoch rev:            5866
Semi major axis:  7991.326 km
Anom period:     118.462388 min
Apogee:           1660.730 km
Perigee:          1567.864 km
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Satellite: rs-4
Catalog number: 13000
Epoch time:       83103.16488872
   Wed Apr 13 03:57:26 1983 UTC
Element set:              99
Inclination:        82.9508 deg
RA of node:         16.7046 deg
Eccentricity:      0.0015428
Arg of perigee:    249.4104 deg
Mean anomaly:      110.5287 deg
Mean motion:    12.06663311 rev/day
Decay rate:         1.12e-06 rev/day^2
Epoch rev:            5810
Semi major axis:  8030.614 km
Anom period:     119.337348 min
Apogee:           1683.317 km
Perigee:          1658.538 km

Satellite: rs-5
Catalog number: 12999
Epoch time:       83103.23063317
   Wed Apr 13 05:32:07 1983 UTC
Element set:              85
Inclination:        82.9663 deg
RA of node:         17.4286 deg
Eccentricity:      0.0009232
Arg of perigee:    270.4692 deg
Mean anomaly:       89.5354 deg
Mean motion:    12.05046105 rev/day
Decay rate:         1.1e-07 rev/day^2
Epoch rev:            5803
Semi major axis:  8037.795 km
Anom period:     119.497503 min
Apogee:           1688.134 km
Perigee:          1673.293 km
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Satellite: rs-6
Catalog number: 13002
Epoch time:       83090.04323333
   Thu Mar 31 01:02:15 1983 UTC
Element set:              51
Inclination:        82.9585 deg
RA of node:         20.3602 deg
Eccentricity:      0.0048999
Arg of perigee:    211.8932 deg
Mean anomaly:      147.9159 deg
Mean motion:    12.13553977 rev/day
Decay rate:           3.4e-07 rev/day^2
Epoch rev:            5684
Semi major axis:  8000.196 km
Anom period:     118.659741 min
Apogee:           1667.131 km
Perigee:          1588.731 km

Satellite: rs-7
Catalog number: 13001
Epoch time:       83099.30110819
   Sat Apr  9 07:13:36 1983 UTC
Element set:              99
Inclination:        82.9645 deg
RA of node:         17.6832 deg
Eccentricity:      0.0020723
Arg of perigee:    207.1801 deg
Mean anomaly:      152.8177 deg
Mean motion:    12.08673596 rev/day
Decay rate:           7.6e-07 rev/day^2
Epoch rev:            5773
Semi major axis:  8021.710 km
Anom period:     119.138865 min
Apogee:           1664.584 km
Perigee:          1631.337 km
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Satellite: rs-8
Catalog number: 12998
Epoch time:       83103.74286519
   Wed Apr 13 17:49:44 1983 UTC
Element set:             211
Inclination:        82.9434 deg
RA of node:         18.1504 deg
Eccentricity:      0.0020772
Arg of perigee:    317.9551 deg
Mean anomaly:       41.9896 deg
Mean motion:    12.02936804 rev/day
Decay rate:           2.01e-06 rev/day^2
Epoch rev:            5799
Semi major axis:  8047.185 km
Anom period:     119.707037 min
Apogee:           1695.202 km
Perigee:          1661.771 km
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